

Fleet & Industrial Supply Center Norfolk

Ocean Terminal Passive Radio Frequency Identification Project



Agenda

- Overview of the FISC Norfolk Project
- Redesigning the Business Process
 - Visibility vs. Transaction of Record
 - Determining Read Context
 - Accommodating Limitations of RFID
- The FISC Norfolk approach
- For further information



Project Overview

- Passive RFID integrated into Container Freight Station operations
- Tag is affixed to each piece during receipt process
- Shipments from DDSP are pre-tagged at source
- RFID used to create container manifests during loading process



What aspect of the business? What do we want from the process?

- What aspect of the business?
 - Document of receipt and loading of export freight in the Container Freight Station.







Out of the truck...

...into the staging area...

... into the SEAVAN shipping container...

... and onto the container manifest.

- What do we want out of the process?
 - Timely and accurate receipts.
 - Accountability for each piece of every shipment throughout the entire cycle.
 - Correct routing of each shipment.
 - Accurate container manifests.



Nature of Our Freight

- We deal with shipment units at the case and pallet level.
- Shipments range in size from small envelopes to multiple pallets.
- Small shipments palletized for movement convenience must all be individually documented.
- Shipments are moved via forklift, and are not depalletized to be processed on high-speed conveyors or via automated sortation.
- Many shipments are to Navy ships, so destination at loading time may have changed since receipt.





Redesigning the Business Process

- Passive RFID technology cannot simply be inserted into existing processes as a replacement of existing manual or barcode applications.
- The business process must be reviewed, and redesigned to accommodate the technology, in order to receive full benefits from the technology.
- Three important questions must be answered before developing the new processes:
 - Implementing a Visibility Tool or a Transaction of Record?
 - How will context be assigned to the reads?
 - How will limitations of the technology be accommodated?



Visibility Versus Transaction of Record

Visibility

- Simply recording where and when shipments were seen
- Compliments existing documentation processes, but does not replace them
- Transaction of Record
 - Replaces existing documentation processes
 - Requires that each RFID read be interpreted to determine a context
 - Requires a high rate of accuracy



Determining Context

- No Context
 - Do not interpret the read, simply record it
 - Applies to using passive RFID as a visibility tool. Cannot be used with a transaction of record.
- Context determined by location
 - e.g., tags seen by the reader in the receiving bay are always processed as receipts
- Context determined by directionality
 - e.g., tag was seen by the reader on the inside of a door, then a few seconds later by a reader on the outside of the door, and is processed as an issue.
- Context dynamically assigned
 - Requires input and output interaction with a user



Rate of Accuracy

- Cannot expect 100% reads of 100% of shipments 100% of the time
 - Business processes must accept this limitation of the technology up front
 - Technology will improve over time, and will soon be dramatically better than it is today, but there will always be rules of physics that will prevent absolute accuracy
- Not acceptable for transactions of record
 - Human interaction required to provide a check and balance that everything that should have been read was read
 - Requires input and output interaction with a user



For FISC Norfolk...

- Wanted a transaction of record
 - Required 100% accuracy of the business process
 - Had to design an interface and process that ensured no shipments were being missed
 - Incorporated both passive RFID and barcode technologies
 - Wanted an validation process to capture freight errors
- Wanted to use the same portal for both receiving and loading
 - Context had to be dynamically assignable
 - Context had to be very specific
 - Specific container into which the shipments were being loaded



Our Solution and Final Business Process

Receiving

- As each shipment is received, label is printed for each piece of the shipment.
- User scans a passive RFID tag to be assigned to that piece.
 - For shipments from DDSP, RFID is already affixed to shipment, and system knows ID from the Advance Shipping Notice.
- System links the ID of RFID tag to the Transportation Control Number & Piece Number of the shipment.







Our Solution, continued.

- Passive RFID reading portal
 - Manned by a portal operator who interacts with the forklift drivers, the freight, and the reader software.





- Prior to bringing freight through the portal, the forklift operator is registered to a specific context.
- The driver's name is then used as the key for setting the portal before each read.



Our Solution, Continued.

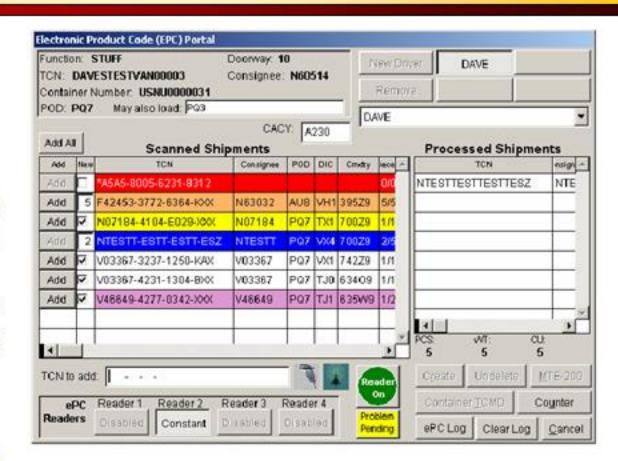
- To activate the portal for each read, the operator and forklift driver determine the number of pieces to be read, and enter that number into the workstation.
- ◆If the RFID reader does not capture the correct number of shipments, a barcode scanner is used until all shipments have been accounted for.





Concept of Operations

- ◆ The system performs validation of each shipment that is read, and determines if it is proper to be applied to the current portal context. The operator is provided a color coded listing of shipments.
- The portal operator then determines what will and will not be processed.





For further information

Our project report is available to anyone who would like to request a copy.

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